CLAIMS

1. Use of CXCL6 for the preparation of a medicament for the promotion of cartilage and/or bone formation *in vivo*.

2. The use according to claim 1, in the prevention or treatment of a cartilage or osteochondral defect.

3. The use according to claim 1 or 2, wherein the source of CXCL6 is a population of CXCL6 expressing cells.

4. The use according to any of claims 1 to 3, wherein the said CXCL6 is recombinant or synthetic.

5. The use according to any of claims 1 to 4, wherein said CXCL6 is administered through gene therapy.

6. The use according to any of claims 1 to 5, wherein said CXCL6 is administered to the osteochondral defect in a gradient.

7. The use according to any one of claims 1 to 6, wherein said medicament further comprises chondrogenic cells or precursor cells thereof.

8. The use according to claim 7, wherein said precursor cells are isolated from synovial membrane.

9. Use of CXCL6-expressing cells for the preparation of a medicament for the promotion of formation of cartilage or bone *in vivo*.

10. The use according to claim 9, for the prevention or treatment of a cartilage or osteochondral defect.

11. The use according to claim 9 or 10, wherein said CXCL6-expressing cells are chondrogenic cells.

12. The use according to claim 11, wherein said chondrogenic cells are isolated from connective tissue.

13. The use according to claim 11 or 12, wherein said chondrogenic cells comprise a foreign DNA encoding said CXCL6, under control of a promoter.

14. The use according to any one of claims 10 to 13, wherein said CXCL6-expressing cells are embedded in a matrix.

15. A composition for use as a medicament comprising a cell population or cells expressing CXCL6.

16. The composition according to claim 15, wherein said CXCL6 expressing cells or cell population are chondrogenic.

17. A composition according to claim 15 or 16, wherein said cells or cell population are embedded in a suitable pharmaceutical carrier.

18. Use according to any one of claims 1 to 14, wherein the cartilage defect is a joint surface defect not related to inflammation.

19. Use according to claim 18, wherein said joint surface defect occurs in the context of osteoarthritis.

20. Use of a compound inducing the expression of CXCL6 for the preparation of a medicament for the promotion of cartilage or bone formation *in vivo*.

21. The use according to claim 20, for the treatment or prevention of cartilage or osteochondral defects.

22. The use according to claim 20 or 21, wherein said compound induces expression of CXCL6 in chondrogenic cells.

23. The use of expressed CXCL6 as a marker for chondrocyte phenotypic stability.

24. The use of CXCL6 for the promotion of cartilage and/or bone formation *in vitro*.

25. A method of modulating the differentiation of a progenitor cell population into a cartilage-producing cell population, said method comprising administering to said progenitor cell population a ligand or inhibitor of the CXCR1 or CXCR2 receptor.

26. The method according to claim 25, which comprises inhibiting said differentiation of a progenitor cell population into a cartilage-producing cell population using an inhibitor of CXCR1 or CXCR2.

27. A method of inducing or restoring chondrocyte phenotypic stability in a progenitor cell population, said method comprising the step of administering CXCL6 to said progenitor cell population.

28. A method of inducing or restoring differentiation of a precursor cell population into chondrocytes, said method comprising the step of administering CXCL6 to said precursor cell population.

29. A method for the detection of a compound or mixture of compounds for the promotion of cartilage and bone promotion in vivo, said compound or mixture of compounds modulating CXCL6 signalling, and said method

comprising the steps of:

-contacting a cell population with a candidate compound or mixture of compounds and

-determining a modified expression level of CXCL6.

30. The method according to claim 29 wherein the cell population is being selected from the group consisting of chondrocytes, chondrocytes precursors and chondrocyte progenitors.

31. The method according to claim 30 further comprising the step of determining one or more morphological or molecular parameters of said chondrocyte, chondrocyte precursor or chondrocyte progenitor cell population.